

U.S. Patent Application Serial No. 10/542,614  
Response to Office Action dated November 14, 2006

**IN THE SPECIFICATION:**

Please insert the following heading after the title of the invention on page 1, line 4:

**Background of the Invention**

Please amend the subheading on page 1, line 5 as follows:

**Technical Field of the Invention**

Please amend the subheading on page 1, line 15 as follows:

**Background Technique Description of the Related Art**

Please amend the paragraph on page 1, line 20 as follows:

In some [[of]] scroll compressors, thicknesses of portions or entire scroll laps of the fixed scroll and orbiting scroll are varied from centers of the scrolls toward the outer sides (see patent document 1 for example).

Please amend the paragraph on page 1, line 24 as follows:

In some [[of]] scroll compressors, a position of an orbiting scroll having asymmetric lap shape which is wound by one turn from outside of a scroll groove is increased in height by one step to form a stepped groove, a center of cylinder enters the stepped groove from an end plate surface, the scroll compressor is provided with a turning bearing having an axis in a region which

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is set from the groove step wall surface and the center of the scroll shape, a fixed lap of the fixed scroll also comprises a stepped lap so that it meshes with the stepped groove and a compression chamber can be formed (see patent document 2, for example).

Please amend the paragraph beginning on page 1, line 35 as follows:

FIG. 6 shows a conventional scroll compressor described in [[the]] patent document 1. As shown in FIG. 6, in a scroll fluid machine in which one of scroll members allows the other scroll member to turn, thereby expanding or compressing fluid, the thickness of a portion or entire shape of a scroll body 22b of a scroll member 22 is increased or reduced from its center toward the outer side.

Please amend the paragraph beginning on page 2, line 33 as follows:

As a known example in which the degree of freedom in design of incorporating compression ratio, the stroke volume, the thickness of the scroll lap is enhanced, there is one described in [[the]] patent document 1. In this known example, thicknesses of portions or entire scroll laps of the fixed scroll and orbiting scroll are varied from centers of the scrolls toward outer sides. Therefore, the incorporating volume ratio is secured while reducing the outside shape, and the strength of the center is secured.

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Please amend the paragraph on page 3, line 25 as follows:

In [[the]] patent document 1, there is no concrete explanation concerning the idea for reducing the leakage loss during the compression process in terms of the asymmetric lap shape.

Please amend the paragraph on page 3, line 28 as follows:

Concerning the asymmetric lap shape, to reduce the leakage loss during the compression process, [[the]] patent document 2 provides a known compact scroll compressor having high efficiency. In this known example, the lap is formed into a staircase shape. With this, the leakage loss during compression can be reduced although the lap is asymmetric in shape.

Please amend the paragraph beginning on page 3, line 34 as follows:

However, [[since]] because the lap is formed into the staircase shape, there is a problem that it is difficult to secure sealing properties between the laps of the staircase portions, the number of producing processes is increase, and cost thereof is increased.

Please amend the subheading on page 4, line 9 as follows:

**Disclosure Summary of the Invention**

Please amend the paragraph on page 4, line 27 as follows:

According to this aspect, [[since]] because the value a/b exceeds 1.0, a compression

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chamber formed on the side of the inner wall of the scroll lap of the orbiting scroll is compressed faster than a compression chamber formed on the side of the outer wall of the scroll lap of the orbiting scroll, and leakage loss during compression process can be reduced. [[Since]] Because the value  $a/b$  is less than 1.5, thicknesses of both the scroll laps do become extremely thin and thus, the strength of the scroll lap can be secured.

Please amend the subheading on the last line of page 6 as follows:

Best Mode for Carrying Out the Invention Detailed Description of Exemplary Embodiments

Please amend the paragraph on page 10, line 9 as follows:

FIG. 4 [[are]] include diagrams showing a volume variation of a compression chamber with respect to a turning angle when an involute angle  $\theta_a$  of the scroll compressor of a second embodiment of the invention is varied in a range of  $\theta_b < \theta_a < \theta_b + \pi$ . FIG. 4 [[show]] shows variation in volume of the compression chamber 15 with respect to a rotation angle (turning angle) of the crankshaft 4 when the involute angle  $\theta_a$  at which the inner wall curve of the scroll lap 12b of the fixed scroll 12 is terminated, and an involute angle  $\theta_b$  at which the inner wall curve of the scroll lap 13b of the orbiting scroll 13 is terminated are varied in the range of  $\theta_b < \theta_a < \theta_b + \pi$ .

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Please amend the paragraph on page 11, line 20 as follows:

FIG. 5 [[are]] shows plan views showing a scroll lap shape of a scroll compressor of a third embodiment of the invention. In FIG. 5, the center position of the basic circle radius a and the center position of the basic circle radius b are separated from each other. With this, the compression chamber 15b formed on the side of the inner wall of the scroll lap 13b of the orbiting scroll 13 is compressed faster than the compression chamber 15a formed on the side of the outer wall of the scroll lap 13b of the orbiting scroll 13, and while keeping this characteristic, the thickness of the scroll lap can be varied. Therefore, the strength of the scroll lap can be adjusted freely.